



FIG. 1

	Desired diagnosis fee	Equipment desired to be diagnosed	Precision of diagnosis	Air temperature	Humidity	Concentration of chlorine gas	--
User a1	300,000 yen	Control panel	Degradation diagnosis	30	80	0.03 ppm	--
User a2	500,000 yen	Circuit board	Degradation diagnosis	20	60	0.08 ppm	--
User a3	1,000,000 yen	Logic IC	Life diagnosis	20	60	0.07 ppm	--
User a4	200,000 yen	Relay board	Degradation diagnosis	15	Not known	Not known	--
-	-	-	-	-	-	-	--
-	-	-	-	-	-	-	--
-	-	-	-	-	-	-	--

FIG. 2

	Diagnostic fee	Equipment to be diagnosed	Precision of diagnosis	Environmental data required	Equipment information required	--
Diagnostic service provider b1	500,000 yen	Control device	Life diagnosis	Air temperature, chlorine ..	Date of installation...	--
Diagnostic service provider b2	3,000,000 yen	EWS	Degradation diagnosis	Air temperature, amount of dust...	...	--
Diagnostic service provider b3	1,000,000 yen	Ordinary IC	Life diagnosis	Humidity...	Date of manufacture of the IC, type of sealing film	--
Diagnostic service provider b4	100,000 yen	Circuit board	Degradation diagnosis	Humidity, chlorine concentration...	Width of wiring, type of resist	--
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	-	-	-

FIG. 3

	Examination fee	Environmental data capable of being examined	--
Environmental measurer c1	50,000 yen	Air temperature, humidity	--
Environmental measurer c2	300,000 yen	Amount of dust	--
Environmental measurer c3	100,000 yen	Concentration of various gases; one type	--
Environmental measurer c4	100,000 yen	Air temperature, humidity, amount of wind	--
-	-	-	--
-	-	-	--
-	-	-	--

FIG. 4

	Type of equipment	Various ratings	--
Equipment supplier d1	Logic IC	Copper wiring, wiring width 15 micron...	--
Equipment supplier d2	Circuit board	Copper pattern, wiring width 0.25 mm, wiring separation 0.5 mm...	--
Equipment supplier d3	MY type relay	Metal joint, contact resistance 0.1 mΩ, coil: enamel coating...	--
Equipment supplier d4	Circuit board (before '94)	Copper pattern, wiring width 2 mm, wiring separation 2 mm, no resist film	--
-	-	-	--
-	-	-	--
-	-	-	--

FIG. 5

	Environmental data required for diagnosis					Diagnosis fee
	A	B	C	D	E	
Diagnostic service provider b1	○	○				Fa
Diagnostic service provider b2	○	○	○			Fb
Diagnostic service provider b3	○		○	○		Fc
Diagnostic service provider b4	○		○	○	○	Fd

FIG. 6

FIG. 6

	Environmental data capable of examination					Measurement fee
	A	B	C	D	E	
Environmental measurer c1	○	○			○	F1
Environmental measurer c2			○	○	○	F2
Environmental measurer c3	○		○		○	F3
Environmental measurer c4			○		○	F4
Environmental measurer c5		○			○	F5

FIG. 7

	Deficient environmental data	Environmental measurers capable of examining the deficient environmental data
Diagnostic service provider b1	B	c1, c5
Diagnostic service provider b2	B	c1, c5
Diagnostic service provider b3	D	c2
Diagnostic service provider b4	D, E	c2

FIG. 8

Desired fee: M

	Diagnostic service provider	Environmental measurer	Diagnosis fee
Candidate 1	b4	c2	Fd+F2+m
Candidate 2	b3	c2	Fc+F2+m
Candidate 3	b2	c5	Fb+F5+m
Candidate 4	b2	c1	Fb+F1+m
Candidate 5	b1	c5	Fa+F5+m
Candidate 6	b1	c1	Over budget

FIG. 9

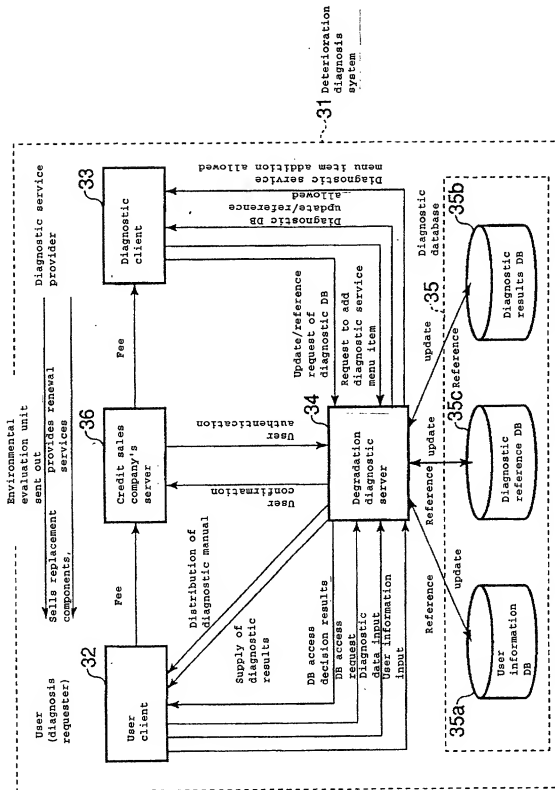
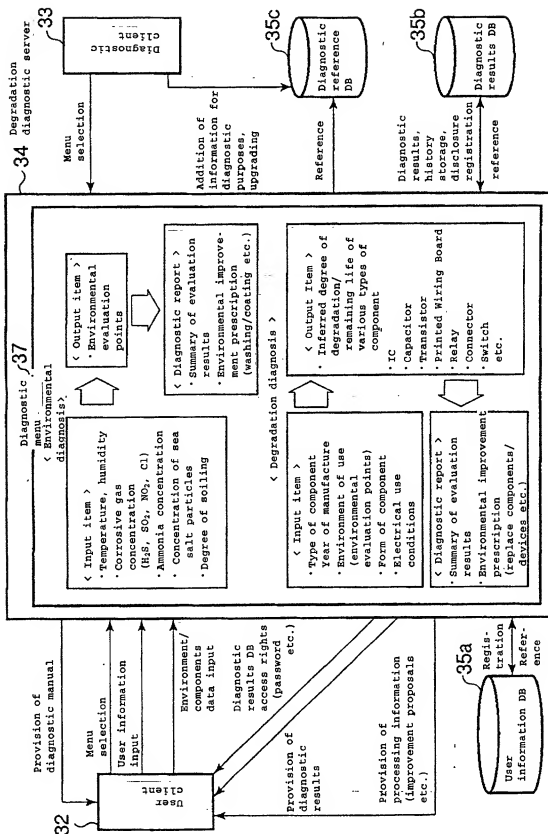


FIG. 10



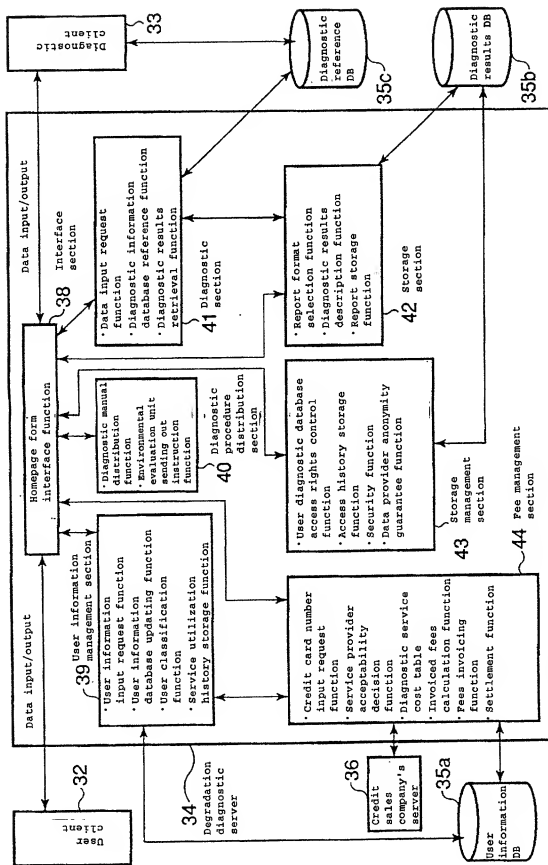


FIG. 12

Environmental range table 45

Environmental factors		Ranges			
I		II	III	IV	
Temperature (°C)	Annual average	A 20 or less	20 < and ≤ 50	25 < and ≤ 30	More than 30
Relative humidity (%)	Rainy season average	B 60 or less	60 < and ≤ 70	70 < and ≤ 85	More than 85
	Annual average	50 or less	50 < and ≤ 60	60 < and ≤ 75	More than 75
Gas (ppm)	Sulphur dioxide (SO ₂)	C ₁ 0.04 or less	0.04 < and ≤ 0.08	0.08 < and ≤ 0.2	0.2 < and ≤ 5
	Nitrogen dioxide (NO ₂)	C ₂ 0.02 or less	0.02 < and ≤ 0.05	0.05 < and ≤ 0.1	0.1 < and ≤ 5
	Hydrogen sulphide (H ₂ S)	C ₃ 0.003 or less	0.003 < and ≤ 0.01	0.01 < and ≤ 0.1	0.1 < and ≤ 10
	Chlorine gas (Cl ₂)	C ₄ 0.002 or less	0.002 < and ≤ 0.01	0.01 < and ≤ 0.1	0.1 < and ≤ 1
Degree of soil	Ammonia gas (NH ₃)	C ₅ 0.1 or less	0.1 < and ≤ 1	1 < and ≤ 10	10 < and ≤ 100
	Equivalent salt deposition rate (mg/cm ² /year)	D 0.03 or less	0.03 < and ≤ 0.06	0.06 < and ≤ 0.12	More than 0.12
	Distance from coast (km)	More than 2	1 < and ≤ 2	0.5 < and ≤ 1	Less than 0.5

FIG. 13

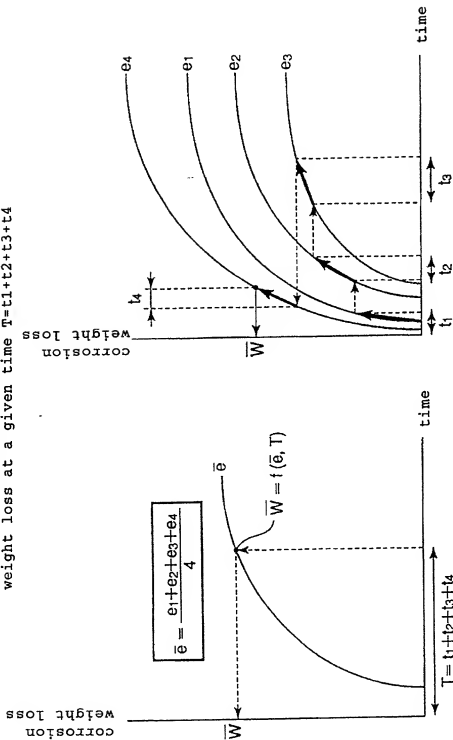
Environmental factor weighting table 46

Environmental factor	Range			
	I	II	III	IV
A	1	2	4	8
B	1	8	16	24
C ₁	1	3	6	9
C ₂	1	3	6	9
C ₃	1	8	14	20
C ₄	1	10	20	30
C ₅	1	2	4	8
D	1	8	15	24

FIG. 14

FIG. 15A

Process of derivation of metal corrosion
weight loss at a given time $T=t_1+t_2+t_3+t_4$



Process of derivation of
mean corrosion weight loss

Process of derivation of
precise corrosion weight loss

FIG. 15A

FIG. 15B

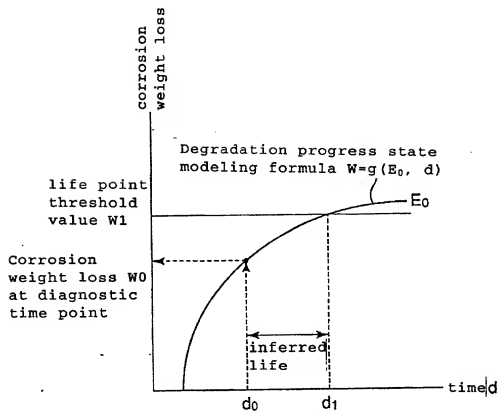


FIG. 1 6

Environmental evaluation points zone table 47

Atmospheric environmental ranges		I		II		III		IV		V	
Environmental factors	Measured values	Evaluation points		Measured values		Evaluation points		Measured values		Evaluation points	
		Measured values		Evaluation points		Measured values		Evaluation points		Measured values	
Temperature (°C) Relative humidity (%) Oxidative gas (ppm) CO ₂ SO ₂ H ₂ S NO _x Cl ₂ NH ₃ Sea salt particles	A	≤20	1	≤25	2	≤70	4	≤35	8	≤35	12
	B	≤60	1	≤65	6	≤70	12	≤80	24	≤80	36
	CO ₂	≤0.02	1	≤0.05	4	≤0.2	8	≤0.5	16	≤0.5	24
	SO ₂	≤0.02	1	≤0.05	6	≤0.2	12	≤0.5	24	≤0.5	36
	H ₂ S	≤0.02	1	≤0.05	3	≤0.2	6	≤0.5	12	≤0.5	18
	NO _x	≤0.02	1	≤0.05	7	≤0.2	14	≤0.5	28	≤0.5	42
	Cl ₂	≤0.02	1	≤0.05	3	≤0.2	6	≤0.5	12	≤0.5	18
	NH ₃	≤0.02	1	≤0.1	3	≤1.0	6	≤10	12	≤10	18
	Sea salt particles	≤0.01	1	≤0.03	5	≤0.1	10	≤0.3	20	≤0.3	30
	Distance from coast (km)	>2.0	1	≥1.5	5	≥1.0	10	≥0.5	20	≥0.5	30

FIG. 17

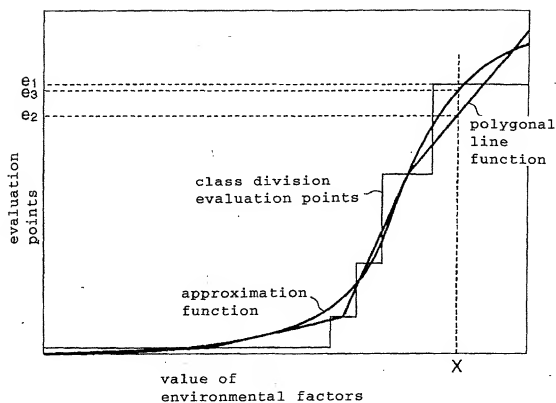


FIG. 1 8

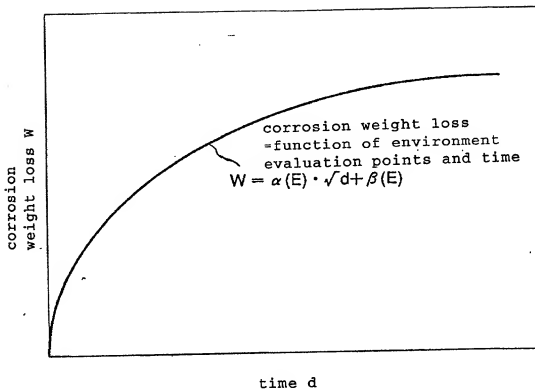


FIG. 1 9